Nutrient Management in Young Walnut Orchards

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To Know Where to Go, Need to Know Where You Start

Check Your Soils Test

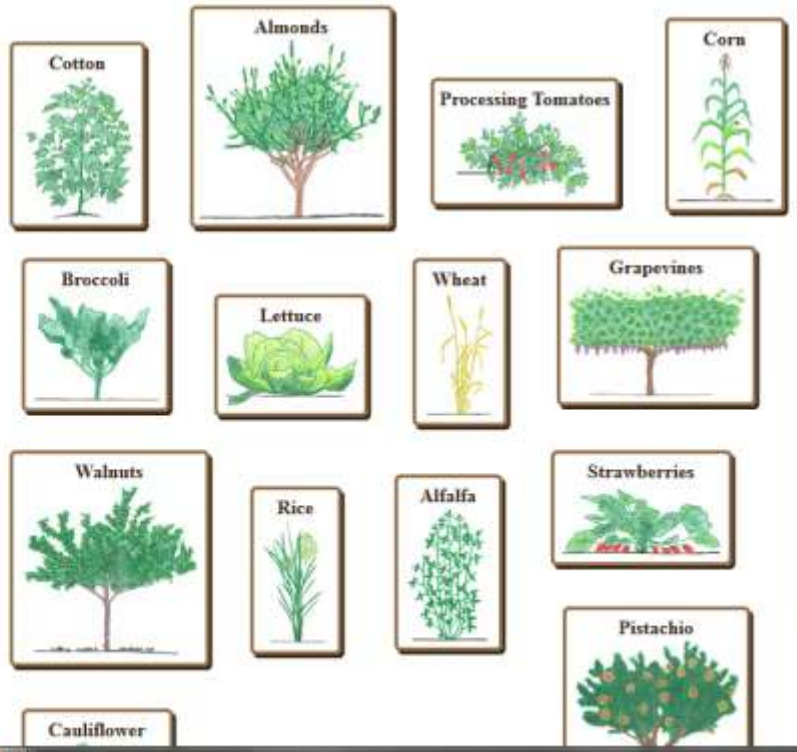
- Most young orchards only need N
- Low P: 10-20 ppm PO_4-P
- Low K: <150 ppm
- http://apps.cdfa.ca.gov/frep/docs/Guidelines.html

Photo: Flickr

Fertilization Guidelines for Major Crops Grown in California

These guidelines are based on research results from studies carried out in California and elsewhere. For an optimal fertilization program, site-specific information on soil type, climate and crop management need also to be take in into account.

After choosing a crop from the list below, detailed information can be accessed by moving the mouse over any shape with the symbol ⓘ.



Developed in collaboration by

cdfa FREP

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Department of
LAND, AIR AND WATER RESOURCES

Soil and Plant Tissue Sampling

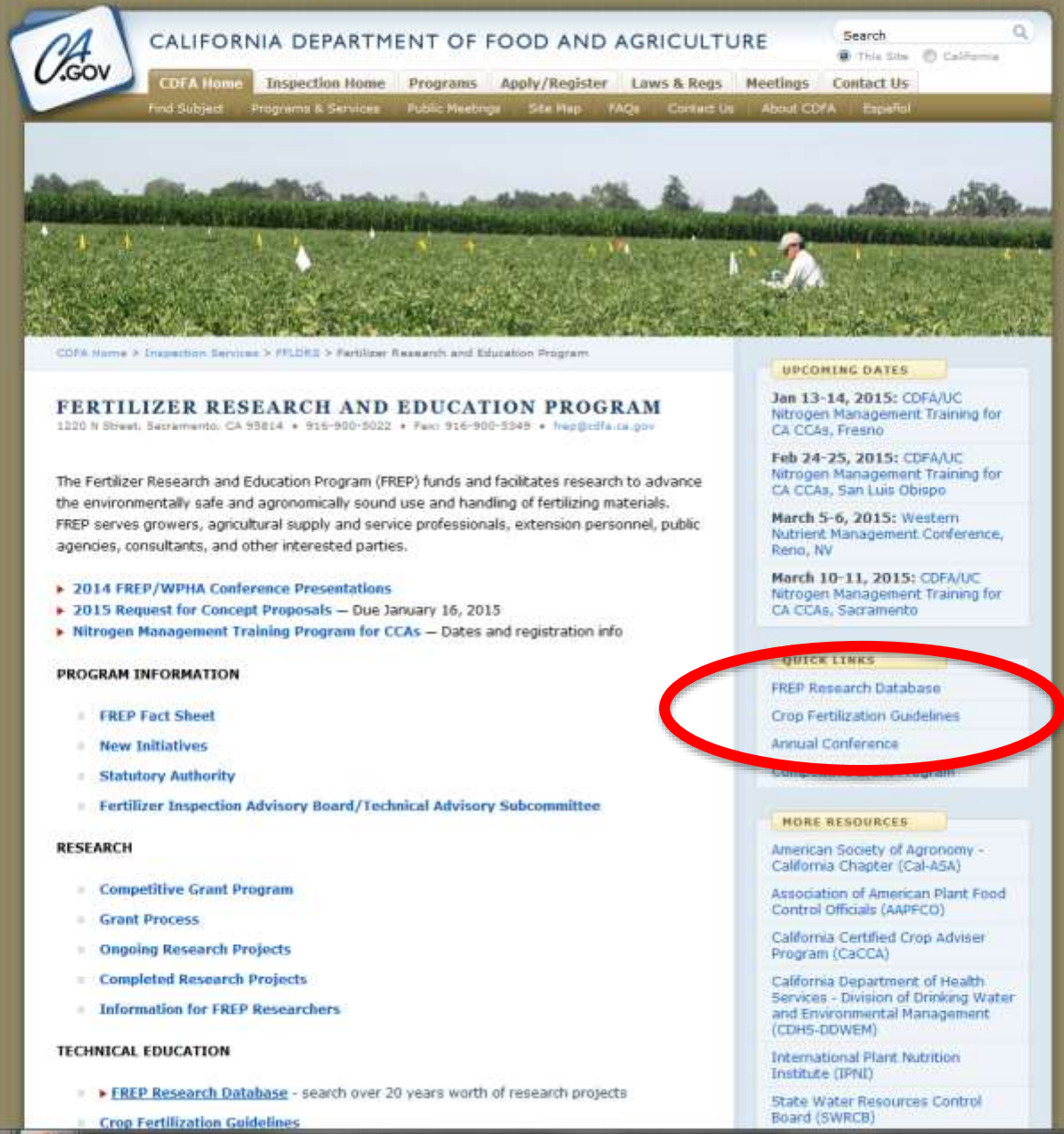
- Soil Test Sampling Instructions
- Sampling for Soil Nitrate Determination
- Soil Sampling in Orchards
- Plant Tissue Sampling

Additional Resources, Links

- Organized by Topic
- Organized by Source

New! Nitrogen Partitioning and Seasonal Uptake Curves

Google “CDFA FREP”, → Crop Guidelines



The 4 R's of Plant Nutrition

- Apply the Right Rate
- Apply at the Right Time
- Apply in the Right Place
- Using the Right Source

Photo: Flickr

Finish Line: Whole Tree N

	Dry Wt (Lbs/Tr)	N (Lbs/Tr)	% N
One year wood	12.9	0.13	1.01%
Branches	542	3.02	0.56%
Trunk	124.6	0.32	0.26%
Root Stump	123.9	0.31	0.25%
Roots	144.7	1.07	0.74%
TREE TOTAL	948.1	4.85	0.51%

*16 year old Hartleys, 50 trees/acre

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Apply at the **Right Rate**

- Match ***Supply*** w/ ***Demand***
- Fertilizer + Water

N Application Rate*		
Tree Age	Lbs / Acre	Lbs / Tree**
Year 1	10-20	0.2-0.3
Year 2	25-50	0.4-0.8
Year 3	50-100	0.8-1.5
Year 4	63-125	1-1.9
Year 5	75-150	1.2-2.3

*CDFA FREP Guidelines

**Assumes 65 trees/acre

Young Walnut N – Rough Rule

Year 1: 0.25 lb N/tree

Year 2 - Double it : 0.5 lbs N/tree

Year 3 - Double it : 1.0 lb N/tree

Year 4-6: Coast @ 1 lb/tree + 30-40 lbs/ton

Apply the **Right Time**

- Match w/ timing of tree demand, root uptake
- Trees take up nutrients when needed, not when applied*
- Mid-spring through summer
- **Avoid N after August**

*Unless they are slow release

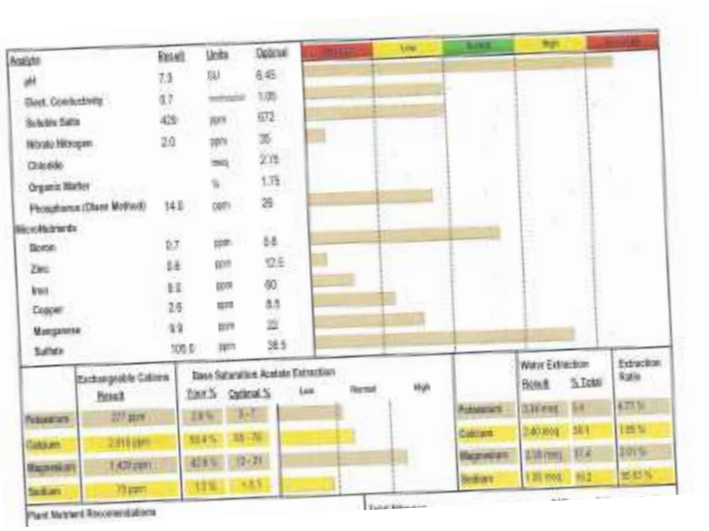
Apply at the **Right Place**

- Delivery to active roots
- N moves w/ water
- Minimize movement below root zone
- Small, frequent applications

Apply the **Right Source**

- Little is known
- Be careful with liquid fertilizers, especially Year 1. Too much N at once can burn the roots.
- Granular is safer Year 1.

P – How low is too low?



- N usually only worry
- Depend on soil pH.
- Too low:
  - If pH < 7.0 → “Bray” <20 ppm PO_4-P
  - If pH > 6.5 → “Olsen” <10 ppm PO_4-P
- 4 lbs P / ton nuts, for Year 4+

P – How to correct, and how much?

- One dose of 25 lbs triple superphosphate per tree (11 lbs P_2O_5) on P-fixing soils lasts 5 years
- Apply in 6” trenches – not broadcast
- Trenches should be in sprinkler range, 2’+ away from the trunk
- Apply Fall or Winter

Photo: Flickr

K – How low is too low?

- N usually only worry
- Too low: <150 ppm K
- Be on look-out if sandy soil
- 12-25 lbs K per ton nuts, so consider some K in Year 4+

K – How to correct, and how much?

- Annual band application.
  - Sandy soils: 200-250 lbs K_2O/acre
  - Heavier soils: up to 900 lbs K_2O/acre
- Beware KCl. Cl can burn young roots. Potassium sulfate (K_2SO_4) is safer.
- Apply in fall to allow winter rains to move K, leach Cl

Photo: Flickr

QUESTIONS?

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